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people, though exposed to no contact with the whites, have partially dwindled away, and their ultimate fate, if the same meteorological condition continues, can be a question of little doubt.

Along the 35th parallel, within the limit of the volcanic disturbances, much of the country is better, and, at some seasons of the year, very attractive. After the melting snows of Spring, and during the autumnal rains, a more smiling picture of green forest glades, sparkling steams, verdant hills, and wild flowers, the eye could not desire to dwell upon; and excepting that the surface of the soil is in most places closely packed with lava rocks, there would seem to be a promising field for the agriculturist. Evidence, however, has been collected of seasons of drought so excessive as to render it doubtful whether more than a small portion of the country could ever be inhabited.

Over the whole of this region and that first alluded to, remains of buildings and fragments of pottery are found, and the fact has been adduced as an argument to establish the present capability of the country to sustain a population; but there is an analogy between these mouldering ruins and the dead forests near by suggestive of a different conclusion, giving rise to a doubt whether the decay of one race of inhabitants might not have been induced by influences that would be effectual to prevent the introduction of another.

The mineral resources of some parts of the country explored are considerable. The ranges of mountains that cross the navigable portion of the Colorado, which belong to the same system as those of California and Sonora, are like them the repositories of a large amount of mineral wealth. They were examined by Dr. Newberry with as great thoroughness and care as the character of the expedition would permit, and found to be traversed by veins of such magnitude and richness as to give promise of a field of extensive mining operations. The metals, as far as observed, were gold and mercury, in small quanity; silver, copper, and lead in rich and valuable disposits; and iron in the greatest abundance. The close proximity of the treasures of these mouutains to water transportation, greatly enhances their value. A copper mine, that promises to be highly successful, is now being worked forty miles above Fort Yuma.

In the country of the upper Colorado, the useful minerals found were iron, coal, rock salt and marble. From their geographical position they have little pecuniary value, though their existence in that region is a fact of great scientific interest. On the sides of the canons were splendid exposures of the stratified rocks which compose the great table lands of New Mexico, exhibiting all the formations from the base of the series to the tertiary.

GEOGRAPHY OF THE UNITED STATES OF AMERICA.

NO. 2

The article in the January number of the Journal was confined to a description of the immediate valley of the Mississippi River. It is now proposed to extend this description to the great plain that lies between the western bank of this river and the Rocky Mountains.

The leading characteristics of this plain are—its extent; the regularity of its outlines; the uniformity of surface, aspect, and slope toward the Mississippi River; the high elevation of its western summit, and the similarity of the meteoric conditions of many portions of it.

Its extent and boundaries:

The Mississippi River, which forms its eastern boundary, has for its whole extent a southerly direction—by far the greater part of its course being near the meridian of 91° west from Greenwich. The river crosses this meridian at eight different points—upon the parallel of 42°; three times near the parallel of 41°; once near the parallel of 40°; once upon the parallel of 34°, and lastly upon that of 30°. It has its source under the meridian of 95°, and its outlet under that of 89°. The most considerable deviations, from a very direct southerly course, are near its source and mouth, near both of which it has an easterly course for nearly 200 miles. At the mouth of the Ohio it deflects easterly about 150 miles to receive that stream. With these exceptions, which seem to correspond to similar deviations in the Rocky Mountains from a northerly and southerly course, the general southerly direction of the river is remarkably uniform.

The western boundary of the great plain is the Rocky Mountains, embracing under this name the whole extent of the range drained by rivers falling into the Mississippi River. At the head of the Canadian, the most southerly branch of the Mississippi descending from the mountains, the water-shed between it and the Rio Grande is under the meridian of 105°. On proceeding north, the general direction of the mountain range inclines slightly to the west, as far as latitude 41°, when its inclination is increased to an angle of nearly 45°, until the parallel of 44° is reached upon the meridian of 111°. It then assumes a northerly direction which it holds to the boundary between the United States and the British possessions. The great plain therefore extends over 19½ degrees of latitude, and about 16 degrees of longitude, embracing an area of more than 1,000,000 square miles. Within the boundaries described is included a considerable portion of the State of Texas, the great part of whose territory presents features of remarkable similarity to that lying far to the north under corresponding meridians. The general form of the whole is that of a *rhombus*, with sides 1,350 by 850 miles respectively in length.

The slope of this plain, within the territory described, is toward the Mississippi River, with a gradual falling off in both northerly and southerly directions from a central point between the parallels 37° and 39°. Between these it has its highest ascertained elevation. From this summit the waters descend to the Gulf of Mexico, the Gulf of California, and the Pacific Ocean. The elevation of this water-shed, or, to speak more correctly, the point of lowest elevation in passing from the hydrographic basin of the Rio Grande to that of the Colorado of the west, is more than 10,000 feet above the sea. A very high elevation is maintained for a considerable distance to the north and south of the summit. From it descend the Platte and Arkansas, which have currents much more rapid than any other considerable tribusaries of the Mississippi and Missouri rivers.

Both the northerly and southerly extremes of the plain have very nearly the same elevation above the sea. At the mouth of the Yellow Stone, in longitude 104°, the elevation of the Missouri River is about 2,000 feet. On the Red River of the South, at a corresponding distance from the Mississippi, the elevation of the plain is very nearly the same. The central portion of the plateau, in long. 104°, is 5,000 feet above the sea. At Fort Benton, long. 109° 45′, near the Grand Falls of the Missouri, the elevation of the river bed is about 2,600 feet above tide. The same meridian prolonged passes but a short distance west of the Great Salt Lake, and over the elevated ranges which crowd the great basin between the Rocky Mountains and the Sierra Nevada.

The elevation of the plateau of the Rocky Mountains above tide water, at the several points crossed by the surveys for a Pacific Railroad, which are the lowest ascertained passes through the mountain ranges, are as follows:

Elevation of	the plateau	on	47th	parallel,	*5,200
"	"	"	42nd	"	7,496
"	"	"	41st	"	7,000
"	"	"	38th	"	9,219
"	"	"	35th	"	6,600
"	"	"	32th	"	4,707

The lowest depression of the plain on the south is occupied by the Red River. This river issues from the base of the Llano Estacado, and flows almost due east to the Mississippi River. Its source is estimated by Capt. Marcy at 2,450 feet above the sea, the cliffs rising on either side some 800 feet to the level of the Llano. But as this is known to have an elevation of about 4,500 feet, the estimated elevation of the source of the river is probably 1,000 feet too low. On going south from this river, an elevation of 4,700 feet is reached between the waters flowing into the Colorado of Texas and the Rio Grande. On the other hand, it is not probable that the summit between the Upper Missouri and the Saskatchawan, east of long. 108°, is elevated 3,000 feet above the sea.

The direction of all the tributaries of the Mississippi, taking their rise in the Rocky Mountains, corresponds to the slope of the plain they traverse, with the exception of the Missouri. From its source, for fully one thousand miles by its meanderings, the course of this river is slightly to the north and east.

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* Elevation of the base of a proposed tunnel.

Under the meridian of 102°, and in latitude 47°, 15′, and on which are the sources of the Mississippi, the former takes a south-easterly course, and for more than a thousand miles has a direction very nearly parallel to that of the Mississippi. For this distance the two rivers are, on the average, about 350 miles apart. The Missouri, however, occupies a much higher elevation. This river descends at the rate of about 9 inches to the mile from Fort Benton to its mouth, a distance of about 2,800 miles. The rate of fall of the Mississippi, above its junction with the Missouri, to the Big Stone Lake is 5½ inches to the mile. At Fort Pierre Chouteau, on the Missouri, in lat. 44° 15′, the elevation of the river is 1,456 feet above the sea, and about 750 feet above the Mississippi upon a similar parallel. The rate of the slope of the plain easterly, between the two rivers on the last named parallel is, consequently, at the rate of a little more than two feet to the mile, while its southerly slope is at the rate of 9 inches to the mile. At the mouth of the Kansas, about 400 miles from the Mississippi by the course of the river, and about 250 miles in a direct line, the elevation of the Missouri is about 320 feet above the Mississippi, and 725 feet above tide water. Below the mouth of the Kansas, the Missouri takes a course very nearly due east in obedience to the general easterly inclination of the plain it traverses.

The Missouri river, owing to the low depression of its bed as it issues from the Rocky Mountains, and to its wide meanderings, which distribute its total descent of 2,200 feet over a distance of 2,800 miles, is the only western tributary of the Mississippi that carries a navigable water line to the very base of the mountains. None of the other great rivers which drain their eastern slopes or the upper slopes of the plain are navigable, except for short distances above their mouths, and some of them not at all. The exceptions are the Red and Arkansas rivers, on their passage through a belt of territory lying immediately west of the Mississippi, in the states of Arkansas and Louisiana, which has an average breadth of about 275 miles. This belt, in all its features, presents a striking contrast to the general aspect of the territory under description. In it are embraced extensive mountainous and alluvial districts, which will be more fully noticed in another place. Through these the Arkansas and Red rivers find their way to the Mississippi, and are navigable to the western boundaries of the states named. West of these boundaries all the leading characteristics of the great plain assert themselves in all their force.

As might be expected, the slope of the great plain increases in degree as it is ascended. Between the mouth of the Kansas and the Mississippi rivers it inclines at the rate of about sixteen inches to the mile. On proceeding west, the rate increases, but not in a marked manner till about the 99th° meridian is reached. After crossing this, the ascent in the valleys of the Platte and Kansas rivers assumes an angle varying from four to ten feet to the mile. Under the same meridian a remarkable change in meteoric phenomena appears to take place, indicating conclusively that the western limit of fertile land, and of rain-fall sufficient for agricultural purposes, is reached.

The following statement will show the elevation above tide and above the Mississippi river, of the plain where the meridian of 99° is crossed by the several routes surveyed for a Pacific railroad, with its distance from and the rate of slope toward the river:

	Feet above tide.	Feet abeve river.	Distance from river.	Rate of descent in ft. per mile.
Parallel of 47°	1,400	600	300	2.00
“ “ 41°	1,100	1,600	400	4.00
“ “ 39°	2,970	1,598	425	3.75
“ “ 38°	1,902	1,562	410	3.48
“ “ 36°	1,832	1,697	410	3.77
“ “ 32°	2,000	1,900	450	4.22

The following statement shows the summit of the western edge of the plain above sea at the lowest mountain passes, their elevation above the Mississippi river, their distances from the river by the several routes surveyed for railroads, and the rate of their descent from the respective summits toward tide-water:

	Elevation above sea.	Elevation above river.	Distance from river by the routes of the Pacific surveys.	Rate of slope toward the river, in feet per mile.
Parallel of 47°	5,200	4,400	1,137	4.66
" " 42°	7,496	7,096	1,000	7.99
" " 41°	7,409	7,000	930	7.09
" " 38°	9,219	8,810	850	10.84
" " 35°	6,705	6,509	854	7.89
" " 32°	4,707	4,560	720	6.53

Notwithstanding the immense elevation of the plain, and the rivers that traverse it, the latter descend with pretty uniform currents for the entire course, and do not fall over successive terraces as does the St. Lawrence river on its way to the sea. As already stated, one of the most important consequences of the rapid slope of the plain described is its lack of navigable water-courses which so characterize, in a remarkable manner, other portions of the United States. A river having a slope greater than ten inches to the mile, has its current so accelerated as to destroy its banks. In such cases the water spreads over a large surface, and the current is a constant succession of rapids and pools. The water in the Platte is only a few inches deep at ordinary stages, and at no time has it sufficient draft to float a steamboat. From the want of navigable water-courses the great plain, if fertile, would possess, at the present time, but little value, in consequence of the cost of sending its produce to a market.

Another characteristic of the region described is the uniformity of its aspect. Its great slopes are not perceptible to the eye, but must be shown by instruments. Those into which the surface is diversified, are so gentle that it may be traversed by wagons in almost any direction. It is without wood, as a general rule, much of it without water.

From the most authentic data, the western limit of arable land is the meridian of 99°. West of that it may eventually be valuable for grazing; but there is not probably sufficient rain-fall for agriculture over any portion of the country west of the meridian named, and east of the crest of the Sierra Nevada and Cascade range of mountains in long. 119°, embracing an area of at least 1,500,000 square miles. The range of mountains last mentioned operate as an effectual barrier to the further progress inland of the currents of air laden with moisture from the sea, consequently nearly all the territory between the Rocky Mountains and the Sierra Nevada and coast ranges is little better than a rainless desert. The small amount of moisture that finds its way from the Gulf of Mexico and the Atlantic, so far inland as the upper portion of the plains, is not condensed upon them, but upon the lofty summits of the Rocky Mountains. None of the rivers descending from them perceptibly increase their volumes in the upper portion of the plains. There is probably as much water in the Mississippi, at the mouth of the Yellowstone, as at a point 1,000 miles below. This river does not discharge as much water for the year as the Ohio, though it drains an area nearly twice as extensive—a conclusive proof of the small amount of rainfall upon the territory it drains.

Another cause, which, with a sufficient rainfall, would render the whole extent of the plain west of the meridian of 99° unfit for agriculture, are the saline and alkaline matters found in the soil. Upon the meridian of 99°, near the northern boundary of the United States, is Devil's Lake, a large body of salt water having probably no outlet. Upon the Red River of the South, under the same meridian are found immense deposits of gypsum and salt, and with them a sterile and inhospitible country. The *Mauvaises Terres*, in latitude 43°, is nearly in the same longitude. It is probable that the whole plain west of this meridian is so charged with alkaline matter as to render it entirely unfit for cultivation.

The most striking exception to the level and treeless expanse, which so generally characterizes the great plain, is the belt of country already referred to, lying south of the Missouri River, and immediately west of the Mississippi. In this region are the Ozark Mountains, which enter the state of Arkansas from the south-west, pass through it in a north-easterly direction, and extend nearly to the south bank of the Missouri River. The highest elevation attained by these mountains is probably in no case more than 1,500 feet above the level of the sea. They can hardly be said to constitute a well defined range. They are cut completely in two by the Arkansas river. They present bold and rugged outlines, with their bases only slightly elevated above the general level of the country. It is in these mountains that are the deposits of iron, lead, copper, and coal, for which the states of Arkansas and Missouri are so justly celebrated.

Another exception to the uniform characteristics of the great plain are what are termed the sunken lands of northern and eastern Arkansas, caused by the great earthquake of 1812. Large tracts disappeared from the surface, their places being supplied by pools and lakes. But such exceptions are rather to be noted by themselves, than to form a part of a paper touching only the leading outlines of the geography of the country.

Another exception to the rule stated is the low land, or what may be termed the Delta of the Mississippi, which has been formed by deposits of vegetable and earthy matter by the river. This Delta may be said to commence a short distance below the mouth of the Ohio. Upon the Gulf of Mexico it has a breadth of nearly 200 miles. For its whole extent it is only slightly elevated above the river. Indeed no portion of Louisiana has an elevation of more than 500 feet above the sea. The Mississippi River at Vicksburg is elevated only about 100 feet above the sea. The elevation of the Red River, near Shreveport, is ascertained to be 96 feet above the Mississippi at Vicksburg, or 196 feet above tide. Through the state of Louisiana the Red River has a fall at a rate not exceeding 4 inches to the mile. Its course, as is that of all the considerable rivers in the state, is southerly. Their rate of fall is very nearly that of the Red River, showing a similar inclination of different parts of the plain within this state. The rate of its descent eastward, on the line of the Vicksburg and Shreveport Railroad, is ascertained to be 7 inches to the mile. From its source to the western boundary of Arkansas, the course of the Red River is very nearly due east. The rate of its descent from its source to its mouth, according to Capt. Marcy, is about 14 inches to the mile. It is probably considerably greater. It has through its whole course a pretty uniform current, unbroken by falls of any considerable magnitude.

With the exception of Florida, Louisiana has a less elevation above the sea than any other state, a considerable portion being less than 100 feet above tide water. The highest land crossed by the line of the Shreveport Railroad is only 400 feet above the sea. It is not probable that the highest elevations in the state exceed this by more than 100 feet. The state of Arkansas presents a double contrast to the general uniformity of the great plain in its alluvial districts, which are similar to those of Louisiana, and in a rough mountainous district already briefly referred to. Another contrast presented by both states are their generally wooded surfaces. In the state of Arkansas, its great river flows nearly east, and has a fall of about 7 inches to the mile. The plain falls to the Mississippi River in a direct easterly course at nearly double this rate. The Arkansas is navigable to Fort Smith during periods of floods, but owing to long droughts, which frequently prevail, it cannot be relied upon for commercial purposes, and will be superseded by railroads as soon as they are constructed.

With regard to the meteorological conditions of the great plain, the data possessed is obtained from observations, confined to a very small portion of it. These are confined to military stations. Those made in the state of Arkansas, and in the eastern portion of the Indian reserves, show an amount of rain-fall nearly equal to that on the Mississippi River upon similar parallels. The Cross Timbers in longitude 99° seem to be the western boundary of abundant rains, and mark distinctly the dividing line between fertile and sterile soils.

The rain-fall and temperature for the year, as well as for the four seasons, is shown in the following table:

Places of observation.	Latitude, north.	Longitude, west.	Elevation, feet.	Mean temperature for the seasons and year. (Fahrenheit's Thermometer.)				Year.	Rain-fall for the season and year				
									Spring. inch.	Summer. inch.	Autumn. inch.	Winter. inch.	Year. inch.
Fort Dodge	43° 00′	94° 03′	780	44.4	73.8	50.8	20.8	47.4	7.92	8.18	8.19	3.06	27.32
Fort Leavenworth	29° 21′	94° 44′	850	53.8	74.1	53.7	29.6	52.8	7.97	12.24	7.33	2.75	30.29
Fort Kearney	40° 38′	98° 57′	2,100	46.8	71.5	49.3	23.0	47.7	10.80	12.05	3.82	1.31	27.97
Fort Laramie	42° 12′	104° 47′	4,470	46.8	71.9	50.3	31.1	50.1	8.69	5.70	3.96	1.63	19.98
Fort Atkinson	37° 47′	100° 14′	2,380	54.2	77.7	54.6	32.1	54.6	13.68	7.15	12.05	2.13	35.01
Fort Arbuckle	34° 27′	97° 07′	1,000	61.7	79.9	62.2	40.8	61.6	8.15	8.98	8.96	4.54	30.57
Fort Belknap	33° 08′	98° 48′	1,600	64.9	80.9	65.1	45.0	64.0	7.09	6,31	6.85	1.75	22.00
Fort Worth	32° 40′	97° 25′	1,100	63.1	80.4	63.4	45.2	63.5	14.50	8.80	9.49	8.07	40.86
Fort Chadbourne	31° 38′	100° 05′	2,500	64.3	76.8	62.5	45.9	62.4	8.52	10.46	8.99	3.91	31.88
Fort Graham	31° 56′	97° 26′	800	65.0	82.4	66.8	48.7	65.7	11.91	6.02	9.37	11.91	40.58
Fort Croghan	30° 40′	98° 31′	1,000	65.9	80.6	67.0	49.4	65.7	11.61	7.80	8.24	8.91	36.56
Fort Jessup	31° 33′	93° 32′	250	66.8	81.3	66.2	51.0	66.3	13.68	10.94	9.74	11.49	45.85
Fort Towson	34° 00′	95° 33′	450	62.4	79.1	61.3	43.9	61.7	15.55	14.36	12.23	9.84	51.08
Fort Washita	34° 14′	96° 38′	700	62.2	79.3	63.2	44.1	62.2	13.19	11.27	10.78	6.42	41.66
Fort Gibson	35° 47′	95° 10′	560	61.0	79.4	61.7	41.0	60.8	11.38	9.68	9.25	6.15	36.46
Fort Smith	35° 23′	94° 29′	460	61.3	77.6	60.1	41.1	60.0	12.46	13.03	9.93	6.66	42.10
Fort Scott	37° 45′	94° 35′	1,000	54.8	74.9	55.3	33.0	54.5	12.57	16.37	8.37	4.79	42.12

DEPARTMENT OF STATISTICS.

AMERICAN AGRICULTURE.*

Mr. President and Gentlemen:

In accepting the honor you have conferred upon me in the Chairmanship of "the Agricultural Section of the American Geographical and Statistical Society," it becomes my duty in opening the Section this evening, to say a few introductory words upon this branch of the Society's labors.

I propose to glance over the field which the Agricultural Statistics of our country are destined to embrace, and refer cursorily to some of the aspects in which, looking at the past, and the present, and onward to the future, they commend themselves to all classes of our reflecting countrymen. The facts which they develop concern alike consumers and producers, farmers and planters, manufacturers, and all engaged in commerce, whose varying interests are so closely and inseparably allied. They have a common interest for all who watch the march of our Republic, and record its progress; and above all they deserve the careful study of legislators and statesmen, who are constantly being called from private life, to frame its laws, to shape its policy, and to determine its destiny.

Most of the governments of Europe have been greatly in advance of us in their appreciation of the value of satistics. England, France, Belgium, and Austria, have for some years applied themselves earnestly to statistical investigation; and in those countries the truth is becoming generally recognized, that the world at large has an interest in the statistics of every nation, as tending to develop natural laws of universal concern to mankind.

In England, the labors of the Statistical Society, whose elaborate and most valuable pub-

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* A Statistical View of American Agriculture: its home resources and foreign markets, with suggestions for the schedules of the Federal Census of 1860. An address delivered, at New York, before the *American Geographical and Statistical Society*, on the organization of the Agricultural Section. By John Jay, Esq., Chairman of the Section and Foreign Corresponding Secretary of the Society. Published by D. Appleton & Co., New York. (Abridged.)